

AMENDMENTS IN THE CLAIMS

Please amend claims 3, 6, 27 and 36 by this amendment as follows and cancel claims 2, 9 and 23-25 without prejudice or disclaimer as to their subject matter by this amendment as follows:

1. (Previously canceled)

2. (Canceled)

3. (Currently Amended) An ink-jet printhead, comprising:

a substrate being a single integrated monolithic and homogenous unit of silicon, said substrate, having a rear surface, said rear surface having a channel having a predetermined depth, wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said substrate;

a nozzle plate coupled to a front surface of the substrate, said nozzle plate being perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice complex hole corresponds to at least one of said plurality ink feed holes; and

a plurality of heaters disposed on the front surface of the substrate, each one of said plurality of heaters being located near corresponding ones of said plurality of chamber-orifice complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes ~~The ink-~~

14 ~~jet printhead of claim 2~~, wherein each one of said plurality of heaters is of an omega shape that
15 surrounds said corresponding ink feed hole.

1 4-5. (Previously canceled)

1 6. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion
12 of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said
13 plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes ~~The ink-~~
14 ~~jet printhead of claim 2~~, wherein each chamber-orifice has a truncated conical shape, wherein a
15 lower end of said chamber orifice facing said substrate faces the corresponding ink feed hole and
16 heater formed on the substrate and the other end having a smaller diameter faces toward an

17 outside of said ink-jet printhead.

1 7-8. (Previously canceled)

1 9. (Canceled)

1 10-22. (Previously canceled)

1 23-25. (Canceled)

1 26. (Previously canceled)

1 27. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality of ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said

10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes, said nozzle plate being a single integrated monolithic and homogenous unit, each
12 chamber-orifice hole having a cylindrical shaped portion on a portion of said chamber-orifice
13 hole closest to a side of said nozzle plate that attaches to said substrate and a conical shaped
14 portion on a portion of said chamber-orifice hole closest to a side of said nozzle plate opposite
15 from where said nozzle plate attaches to said front surface of said substrate, said conical shaped
16 portion being a section of a right circular cone with an axis perpendicular to said front surface of
17 said substrate and perpendicular to said surfaces of said nozzle plate;

18 ~~said ink-jet printhead being manufactured by a process geared for mass production, said process~~
19 ~~comprising the steps of:~~

20 ~~— etching said channel into a rear surface of said substrate;~~

21 ~~— etching a plurality of holes through to said front surface of said substrate to perforate said~~
22 ~~substrate;~~

23 ~~— depositing a first plurality of signal lines and a second plurality of signal lines on said~~
24 ~~front surface of said substrate, each one of said first plurality of signal lines terminating near~~
25 ~~termination points of corresponding ones of said second plurality of signal lines, each of said~~
26 ~~terminating portions of said first and said second signal lines terminating near at least one of said~~
27 ~~plurality of holes perforating said front surface of said substrate;~~

28 ~~— depositing said heaters made of a resistive material onto said front surface of said~~
29 ~~substrate so as to said connect terminating ends of each one of said first plurality of signal lines~~
30 ~~with corresponding terminating ends of said second plurality of signal lines, said resistive~~

31 ~~material being near to at least one of said plurality of holes perforating said front surface of said~~
32 ~~substrate; and~~

33 ~~— attaching said nozzle plate perforated by said plurality of nozzle holes onto said front~~
34 ~~surface of said substrate so that each one of said plurality of nozzle holes is aligned to~~
35 ~~corresponding ones of terminating ends of said first and said second signal lines, said resistive~~
36 ~~material, and at least one of said plurality of holes perforating said front surface of said substrate,~~
37 ~~said resistive material being essentially omega in shape and surrounding corresponding ones of~~
38 ~~said plurality of holes perforating said front surface of said substrate.~~

1 28-35. (Previously canceled)

1 36. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice

11 complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion
12 of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said
13 plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes ~~The ink-~~
14 ~~jet printhead of claim 2,~~ said nozzle plate being a single integrated monolithic and homogenous
15 unit, each chamber-orifice hole having a cylindrical shaped portion on a portion of said chamber-
16 orifice hole closest to a side of said nozzle plate that attaches to said substrate and a conical
17 shaped portion on a portion of said chamber-orifice hole closest to a side of said nozzle plate
18 opposite from where said nozzle plate attaches to said front surface of said substrate.

1 37. (Previously Amended) The ink-jet printhead of claim 36, said cylindrical shaped
2 portion of each chamber-orifice hole having an axis that is perpendicular to said front surface of
3 said substrate and perpendicular to surfaces of said nozzle plate.
